In-situ Equation of State Measurements of Antigorite	X17B1

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The extent to which dense hydrous magnesium silicates can transport water to the mantle via mature, relatively cold subducting slabs depends on the thermodynamic properties of "lower" pressure and temperature minerals such as talc and antigorite. In addition to thermoelastic data on talc, phase equilibria experiments of key reactions and calorimetric studies of phases in the MgO-H_2O-SiO_2 system that we have reported previously, we present here the results of *in-situ* equation of state measurements of natural antigorite, $(Mg_{.96}Fe_{.04})_{48}Si_{34}O_{85}(OH)_{62}$).

The molar volume of antigorite, as a function of pressure (to 6 GPa) and temperature (to 823 K) was measured *in-situ* in a DIA-type multi-anvil high-pressure apparatus (SAM-85) at the National Synchrotron Light Source. NaCl was used as pressure calibrant and also to reduce the deviatoric stress, which ranged from $\sim$ 1 % (for samples that were pressurized prior to heating) to less than 0.2 % of total pressure for samples that were cycled to high temperature after pressurization. Macroscopic deviatoric stress in the NaCl was determined from the relative strains of the diffraction peaks. The relative changes in V/V_0 as functions of pressure and temperature were determined by indexing the diffraction lines to a single layer monoclinic cell.

The 298K unit cell volume data (V_0= 365.5 Å^3) can be fitted to a second-order Birch-Murnaghan equation of state ($K'_{298} = 4$) with K = 58.7(3) GPa or to a third-order Birch-Murnaghan equation with K = 60.4 (2.9) GPa, and $K'_{298} = 3.2$ (0.1). We are currently indexing the hight temperature data (at P) to obtain thermal expansivity as the next step in the construction of a comprehensive, self-consistent data set.